

## ABSTRACT

A process for reducing the resources employed in real time to communicate a message between related nodes that are separated by multiple degrees of separation in a social network. At least a portion of the shortest path for the multiple degrees of separation between at least two related nodes in a social network is determined out of band prior to the initiation of a process to communicate between the related nodes. By pre-processing at least a portion of the degrees of separation for the shortest path between the nodes, the actual resources employed in real time to calculate the entire shortest path can be reduced. Typically, approximately fifty percent or more of the shortest paths for the degrees of separation between related nodes in the social network are pre-processed. Since the amount of resources for determining the shortest path for each degree of separation can exponentially increase with each degree, the pre-processing of a portion of the degrees of separation along a shortest path can significantly reduce the resources required in real time to complete the determination of the shortest path. Also, if a common intermediate node is identified in the pre-processing of the shortest paths for two nodes in the social network, the intermediate shortest paths can be stored for reuse as a complete shortest path between these two nodes,

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